Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C. 20554

In the Matter of	**)**	
	)	
Amendment of Parts 1, 2, 15, 74, 78, 87, 90, and 97	**)**	**ET Docket No. 12-338**
of the Commission's Rules Regarding	**)**	
Implementation of the Final Acts of the World	**)**	
Radiocommunication Conference (Geneva, 2007)	**)**	
(WRC-07), Other Allocation Issues, and Related Rule	**)**	
Updates	**)**	

To: The Commission

REPLY COMMENTS OF ARRL, THE NATIONAL ASSOCIATION FOR AMATEUR RADIO

ARRL, the national association for Amateur Radio, formally known as the American Radio Relay League, Incorporated (ARRL), by counsel and pursuant to Section 1.415(c) of the Commission's Rules [47 C.F.R. § 1.415(c)], hereby respectfully submits its reply to certain of the comments filed in response to the *Notice of Proposed Rule Making and Order*, FCC 12-140, 27 FCC Rcd. 14598, released November 19, 2012 (the "*Notice*"). Some of the filed comments addressed the portion of the *Notice* which dealt with the Low Frequency (LF) and Medium Frequency (MF) bands. While the majority of the comments filed in this proceeding with respect to the LF bands supported the allocation of the 135.7-137.8 kHz band to the Amateur Radio Service on a secondary basis, several power utilities and their trade association, the Utilities Telecom Council (UTC) opposed the allocation due to concerns about potential interference to power line carrier (PLC) operations. Additionally, though the comments in this proceeding almost unanimously expressed strong support for the Commission's proposal to elevate the

secondary Amateur Service allocation in the 1900-2000 kHz band to primary status, one manufacturer of ocean buoys that are designed transmit in the 1900-2000 kHz band opposed that proposal.[1] ARRL limits its reply comments in this proceeding to these two issues. In continued support for the allocation of a small LF band at or near 135.7-137.8 kHz to the Amateur Radio Service on a secondary basis, and in continued support of the proposal to upgrade the existing Amateur Radio Service allocation in the 1900-2000 kHz band from secondary to primary status, ARRL replies as follows:

I. The Record Establishes That There Can Be No Potential Interaction Between Amateur Radio Stations Operating at 135.7 to 137.8 kHz and PLC Systems Operating in that Segment, Where the Amateur Station is Separated From Transmission Lines Carrying PLC by One Kilometer or More.

1. There are numerous comments - a majority in this proceeding - filed by Amateur Radio operators who support the 135.7-137.8 kHz allocation under consideration by the Commission. Adoption of this international allocation in the domestic Table of Allocations would implement the decision from the World Radiocommunication Conference (Geneva, 2007) (WRC-07) to allocate the 135.7-137.8 kHz band to the Amateur Radio service on a secondary basis in all ITU Regions [subject to RR 5.67A, which restricts the use of this LF allocation to Amateur Radio stations transmitting with a maximum equivalent isotropically radiated power (EIRP) of 1 Watt].

2. However, several power utilities[2] and UTC oppose the allocation, expressing concern about potential interference to PLC systems. The common, and ARRL suggests decisional problem with each of these comments is that none provides any technical evidence whatsoever

[1] Notably, no user of ocean buoys submitted any comments in this proceeding.

[2] In addition to the comments of UTC, ARRL responds herein to the comments filed by Dayton Power and Light Company; PPL Electric Utilities Corporation; Entergy Services, Inc; Centerpoint Energy Houston Electric, LLC; Excelon Corporation; American Electric Power Company; American Transmission Company, LLC; and Nextera Energy, Inc. These comments contain similar or identical arguments and in many cases, similar or identical wording, indicating that a form for opposing comments was circulated among these power utilities. Except as otherwise noted herein, these comments will be responded to by ARRL collectively.

that could be used to support their claim that there is some interference potential. The comments of the power utilities are all to the effect that, as UTC phrased it: "UTC is concerned that amateur radio services in the band could (sic) cause harmful interference to PLC operations and that PLC operations would (sic) cause harmful interference to amateur operations in the band. Coexistence with amateur operations in the band does not appear to be practically feasible." The reader of these unsupported statements is, however, left without any ability to evaluate them quantitatively. UTC and the utilities purport to evaluate the merit of Amateur Radio experimentation at LF, and then to balance their own evaluation of that value[3] against the unestablished "relative risk to electric service reliability." Not surprisingly, that balancing leads them to conclude that the unquantified "risk" of interference outweighs their view of the benefit of Amateur Radio experimentation in the band.[4] Aside from the self-serving nature of that balancing effort, it is futile indeed where there has not been established by any of the utilities or UTC that there is any interference potential whatsoever.

3. Perhaps UTC and the utilities are comfortable with the fact that the Commission, in this Notice in this proceeding, essentially placed the burden on Amateur Service advocates to establish that the creation of an Amateur allocation at LF would not predictably interfere with

[3] For example, American Transmission Company states that "the negligible benefit to the public of such frequency allocation is substantially outweighed by the costs to the electric utilities such as ATC. Amateur Radio users are recreational users that have access to numerous other frequencies with which to pursue their hobby." Centerpoint Energy Houston Electric, LLC states in their comments that "The importance of protecting the Bulk Electric System and the costs that will be incurred by electric utilities to modify the electric systems outweighs the desires of the radio operators." It is respectfully suggested that these evaluations substantially and quite intentionally undervalue Amateur Radio experimentation. The Commission, fortunately, has not made the same mistake. See, e.g. 47 C.F.R. §97.1.

[4] As noted in ARRL's comments, the premise of the administrations that agreed to the worldwide allocation of 135.7-137.8 kHz to the Amateur Service (an allocation to which the United States did *not* object) included the following: (to) provide radio amateurs with the opportunity to participate in and contribute to a new aspect of radiocommunications which would be consistent with the basis and purpose of the amateur service and would further the self-training in the radio art that is a principal obligation of the amateur service; (and to) provide an opportunity for experimentation with equipment, techniques, antennas and propagation phenomena in an interesting frequency band heretofore unavailable to the amateur service.

incumbent PLC systems. At paragraph 17 of the Notice, the Commission states that, because PLC systems operating under Section 15.113 of the Commission's Rules serve functions such as tripping protection circuits if a downed power line or other fault is detected in the power grid, the Commission would only consider adding an amateur allocation if it is "comfortable" that Amateur Radio and utility PLC systems could successfully co-exist in "the band." [5] To the extent that this remark placed the burden on the Amateur Service to go forward with a showing that there is basic compatibility between Amateur stations and PLCs in this small segment, ARRL has clearly met that burden.

4. What ARRL has demonstrated in its comments in this proceeding is that **there is <u>no</u> risk of interference *at all* from Amateur stations to PLC-carrying transmission lines using the 135.7-137.8 kHz band at 1 Watt EIRP, where the geographic separation between the two is 1 kilometer or more**. Even within that range, the likelihood of interference is exceptionally low. Nothing in the record to date rebuts that showing. The only utility comment that fairly and honestly has evaluated the interference potential from Amateur Stations to PLC-carrying transmission lines is American Electric Power Company (AEPC). After stating its concern that an Amateur allocation at 135.7-137.8 kHz would permit licensed Amateurs, if interfered with in that segment to cause power utilities to cease using the band, [6] AEPC stated:

[5] As noted in ARRL's comments filed earlier in this proceeding, it is unclear from the Notice whether this reference to "the band" refers only to the 135.7-137.8 kHz band, or whether the reference is to the entire 9-490 kHz band utilized to varying degrees by PLCs. If "the band" refers specifically to the 135.7-137.8 kHz segment, ARRL reiterates that the use of that specific segment is not critical. The original specification of the 135.7-137.8 kHz as an international allocation came from Europe. Moving a few kilohertz would not be a problem in this case. What is a problem, however, is that power utilities are usurping the entire LF spectrum and more, based on unestablished and unquantified claims of interference potential for applications that are premised on nothing more than an unprotected, Part 15 authorization to operate. PLC operation represents an exceptionally *inefficient* use of the entirety of the 9-490 kHz band, to the extent that it is allowed to preclude any other use of that large band, given the extremely low level of band occupancy overall.

[6] This concern is easily resolved, as is discussed below.

> We believe, to a much lesser degree, there is a risk that the Amateur radio operators will interfere with AEP PLC applications. At 1 Watt, the concerns (sic) would have to include an extremely large antenna or very close proximity to a Transmission line.

The record in this proceeding and the record in Docket 02-98 [7] *are devoid of any evidence whatsoever that Amateur stations separated from PLC-carrying transmission lines by 1 kilometer or more have any interference potential to PLCs*. It is, furthermore, clear that power utilities do not use PLC on all transmission lines everywhere. Even where PLCs are used on transmission lines, not all PLCs utilize the 135.7-137.8 kHz segment, or the 4 kilohertz on either side of that small segment. There are, therefore, vast areas of the country in which Amateur stations could effectively utilize this small, 2.1 kHz band throughout the United States without *any potential whatsoever* for interaction with PLC systems. Given these uncontroverted facts, the comments of the utilities to the effect that (as UTC stated at page 1 of its comments) "(c)oexistence with amateur operations in the band (sic) does not appear to be practically feasible" is at best unimaginative; it reflects a deep misunderstanding of the nature of Amateur radio use of spectrum in the LF range;[8] and there is clear evidence in the record [9] that the utilities are quite openly guilty of spectrum hoarding.

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[7] *Amendment of Parts 2 and 97 of the Commission's Rules to Create a Low Frequency Allocation for the Amateur Radio Service*, ET Docket No. 02-98, *Report and Order*, 18 FCC Rcd. 10258, 10261 (2003); *recon denied*, 19 FCC Rcd. 6536 (2004).

[8] UTC claims, for example, citing comments filed in the the Docket 02-98 proceeding, that Amateur operations are both "unpredictable and uncoordinated" and that "even under the best of circumstances, interference from amateur operations would be difficult, if not impossible, to avoid or locate." It states that power limits won't protect PLC systems; that antenna limits would be necessary as well, and that a 200-foot antenna height limit for amateurs in this band would "help to provide some basis upon which to further develop a coexistence mechanism for fixed amateur radio operations, but not for mobile." Given the antenna requirements for LF operation, the suggestion that there would be mobile Amateur operation in this band is really quite absurd. Suffice it to say that if uncoordinated Amateur operation at 135.7-137.8 kHz is limited to areas greater than 1 kilometer from transmission lines, and for operation within such distances, 30 days' prior notification is to be provided to UTC and an opportunity to object to such operation where the transmission line at issue is found to be carrying PLC in this frequency range, each and all of UTC's objections of necessity disappear completely.

[9] For example, UTC states at pages 7 and 8 of its comments that "…even though there may be other bands in the 9-490 kHz range that would be a 'better fit from a spectrum sharing viewpoint,' the Commission should refrain from making any alternative allocations for amateur operations in these bands at this time because it is likely that those

II. A Notification Process for Amateur Operation at LF Within 1 Kilometer of Transmission Lines is Eminently Workable.

5. At page 6 of its comments, UTC stated that "there is no practical co-existence mechanism that would enable amateurs and PLC to share the same band." That is, frankly, a ridiculous contention. The Commission could, as ARRL has suggested, without the slightest risk of PLC interference to power utilities, and without any cost to any utility whatsoever, adopt rules immediately that (1) permit Amateur station operation, fixed or temporary, at 135.7-137.8 kHz at any location under FCC jurisdiction which is greater than 1 kilometer distance from a transmission line, with power levels and antenna height limits as discussed in the Notice and in ARRL's comments filed in this proceeding; and (2) permit such Amateur operation *within* 1 kilometer of a transmission line, provided that there has been 30 days' advance notification provided to UTC (or some other entity which has knowledge of which transmission lines are presently carrying PLC signals in or near that frequency range and which are not) of the proposed LF operation. As noted in ARRL's comments, the number of Amateur Radio experimenters that will need to make use of that notification procedure is sufficiently small that it cannot be said to be a burden on anyone. ARRL stands ready, willing and able to act as the clearinghouse and the single point of contact for such Amateur notifications to UTC and/or any other utility coordinating entity, to make sure that the process works smoothly and without creating a burden for anyone.

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bands will be used for PLC to an increasing extent." NextEra energy, Inc. states at the second unnumbered page of its comments that it "does not think that the traditional utility band from 9 to 490 kHz should be allocated to amateur radio operators. PLC has been a very reliable means of communication; however, it is vulnerable to interference from transmitters at or near a utility's operating facilities." NextEra takes this startling position while stating that "(a)lthough we are not currently using any PLC frequencies from 400 kHz to 490 kHz, we think that it is just a matter of time before use of frequencies in this range is required for high voltage transmission and substation assets." Seldom in Commission allocation proceedings have such admissions of spectrum hoarding been made with such candor.

6. UTC's and the utilities' opposition to any Amateur allocation is premised not only on insubstantial and unsupported fears of interference to PLC operation. They argue as well that if the allocation is made, Amateur stations will be interfered with by PLCs in that frequency range, and the Amateurs will use the fact of that interference to complain to the Commission, thus to force PLCs to cease operating in that frequency range. While indeed the normal operating condition for Part 15 facilities is the requirement that they cannot cause interference to licensed radio services with allocations in the band used by the unlicensed devices, and must accept all interference from licensed radio services, [10]Amateur Radio operators have a long history of successful sharing with Part 15 devices in other bands. Never has the Amateur Service attempted to oust an unlicensed user from an Amateur allocation due to interference concerns. As a practical matter, there is very little enforcement opportunity after allocation decisions and Part 15 frequency band authorizations are made. All determinations of compatibility must be made at the rulemaking stage. Interference to Amateurs from PLCs is highly unlikely as a practical matter. LF operation of most Amateur stations further than 1 kilometer from transmission lines virtually insures against any claim of interference based on PLC operation.[11] Because Amateur stations must avoid high ambient noise areas in order to make use of the LF, MF or HF bands generally, they will not wish to locate LF stations near transmission lines, because the noise from the lines

[10] The inconvenient truth that is left *sub rosa* in the utilities' comments in this proceeding is that, to the extent that PLC is part of critical infrastructure and is susceptible to interference from one-watt transmitters at *any* distance separation from the transmission lines, PLCs are not an example of responsible system architecture, and Part 15 is the wrong regulatory paradigm for them. It is unclear how PLCs were, for example, able to avoid interference from the formerly used Groundwave Emergency Network (GWEN) which operated at 50 kW to large antennas.

[11] That said, it is noteworthy that power utilities have been, generally speaking, slow, unwilling or unable to respond to or resolve complaints from Amateur Radio operators about excessive power line noise in residential areas. This is a problem that is unrelated to PLC operation. While some utilities do timely respond with competent staff able to resolve interference complaints when they are alerted to them, power line interference to Amateur Radio operations in residential areas is a separate, widespread and occasionally very serious problem, completely unrelated to PLC operation. The Commission, for its part, has been extremely slow or unwilling to commence enforcement proceedings, even in the most egregious cases of power line interference which precludes Amateur Radio operation on many or all MF and high-frequency bands. Nothing herein indicates any intention by ARRL to waive these concerns or to abandon its effort to cause a greater level of cooperation and responsiveness by electric power utilities to normal power line interference cases.

(which is unrelated to PLC) will inhibit or preclude two-way Amateur communications or reception of propagation beacons in the LF allocation.

7. UTC anomalously states that, while it opposes an Amateur allocation at 135.7-137.8 kHz, Amateur operation can nevertheless be accommodated by Part 5 experimental licenses (or Part 15 operation). Amateur experimentation cannot, in fact, be accommodated to the extent necessary at 160-190 kHz under the Commission's Part 15 rules, given the antenna limitations in Section 15.217. Nor is it logical to argue that Part 5 experimental licensing for radio Amateurs at 135.7-137.8 kHz provides any greater interference protection to PLCs than would an allocation and Part 97 service rules that incorporate the technical limits and notification requirements set forth herein and in ARRL's comments in this proceeding. If UTC's point is that a Part 5 experimental authorization would preclude Amateur complaints of interference against a Part 15 unlicensed user of spectrum, the concern of interference to radio Amateurs from PLCs is a red herring, as discussed immediately above.

8. UTC and the utilities make much of the Commission's decision in 2003, in which it declined to make an Amateur allocation at LF because of concerns about interference to PLCs. They claim that nothing has changed since 2003 and that the Commission's denial of an allocation for Amateurs in this band was correct then and still is now. Of course, the worldwide international allocation of 135.7-137.8 kHz to the Amateur Service demands reevaluation of this issue now. The United States should have an incentive to conform its rules to the worldwide allocation table – a situation that did not exist in 2003. Furthermore, in 2003 the Commission did not decline to make the LF allocation requested by ARRL because of any specifically ascertained interference potential or incompatibility. There was no evaluation of the conditions under which Amateur stations could utilize this band without concerns of interference. Instead, the

Commission avoided the issue entirely and, as the utilities are doing now, simply balanced the perceived importance of PLC operation against the perceived importance of Amateur Radio experimentation in the band. This superficial analysis was inefficient spectrum management then and it should not be repeated now. ARRL has provided herein and in its comments in this proceeding an unrebutted and eminently workable plan for interference-free LF operation by radio Amateurs without any risk, cost or burden to utilities. The utilities, by contrast, have thus far responded by stonewalling and stating their unwillingness to attempt to accommodate any amateur operation in the LF range, *even with respect to spectrum that they admit that they are not now using at all*. This position cannot be sustained.

9. Though UTC and the utilities cannot envision a notification process for Amateur station operation at LF within 1 kilometer of a transmission line, ARRL offers a clearly workable plan. While there is no justification for any restriction or notification procedure for Amateur station operation outside 1 kilometer of a transmission line (other than the power limit and antenna height limit proposed in the Notice, to which ARRL agrees), ARRL is flexible as to the nature, protocols and content of notifications to be provided to utilities in those few instances where an Amateur station might wish to operate at LF from a location *within* 1 kilometer of a transmission line. Whatever the procedure for such a notification process, however, it should not prevent Amateur stations from operating at LF at locations where there would not be interference to PLCs, such as where the transmission line to which the Amateur LF station is proximate does not carry PLC at or near 135.7-137.8 KHz.

III. The Commission Should Elevate the Secondary Amateur Service Allocation in the 1900-2000 kHz Band to Primary Status.

10. As noted above, the only comment in this proceeding to date stating any opposition to the Commission's proposal to raise the Amateur Radio allocation from secondary to primary in the 1900-2000 kHz band is a "letter" dated February 25, 2013 filed by ITM Marine, of Federal Way, Washington (ITM). This company is an importer and distributor of marine buoys used, they say, for "USA based high seas migratory species fishing fleets in the Atlantic and Pacific Oceans." ITM states that these devices have been used for the past 30 to 40 years, and that there are at least 500 active vessels and possible 250-500 more in the United States, which are using radio buoys to locate fishing nets and equipment offshore. ITM claims initially that these are "licensed for use in the 1900-2000 kHz band", but then later in its filing explains the complete absence [12] of any non-Federal licenses in the ULS by stating that (1) since these buoys are "primarily used offshore" in "international waters" the operators did not license them for use in the USA; and (2) the owners already have licenses for the vessels' "transmitting equipment" and believe that the buoys fall under their licenses as "ship's equipment."

11. Neither of these explanations is valid. The fact is that each and all of these hundreds of buoys that ITM claims are deployed and which ITM has sold to United States citizens for use in conjunction with fishing vessels is an illegal transmitter, regardless of where deployed. There is no marine allocation of this band and no Part 80 ship license permits radiolocation in any portion of the 1900-2000 kHz band. Nor may any United States- registered vessel operate Part 90 equipment on any frequency for radiolocation without a license from the Commission. Operation pursuant to Section 90.103 of the Commission's rules in the 1900-1950 kHz or 1950-2000 kHz segments clearly necessitates a license. For years, radio Amateurs have suffered interference in the 1900-2000 kHz band from these illegal, unlicensed ocean buoys. ITM Marine's comments

[12] As of July, 2012, according to the Notice in this proceeding, the Commission's Universal Licensing System (ULS) database showed no non-Federal radiolocation licensees at 1900-2000 kHz.

reflect a disquieting ignorance of the licensing obligations and limitations on the deployment of these devices. The Commission should consider an investigation of this company to ascertain how many of its RF products have been marketed and sold to United States-registered fishing vessels and to whom, and what the company's marketing of its products includes by way of regulatory disclosures, since illegal operation of these ocean buoys is ongoing in large numbers. It is also suggested that the Commission include in any final order in this proceeding an instruction to fishing vessels using these devices without appropriate licenses to cease using them unless and until a license is obtained, and compliance with Section 90.101 *et seq*. is achieved.

12. ITM is apparently also unaware of the basis for the allocation of this band to the radiolocation service in the first place. As noted in ARRL's comments in this proceeding, until 1983, the 1800-2000 kHz band was allocated to the Amateur Service on a shared basis with the radionavigation service. In 1983, the Commission allocated the 1800-1900 kHz band to the Amateur Service on an exclusive basis, and the 1900-2000 kHz band to radiolocation on a primary basis for Federal and non-Federal use and, pursuant to Footnote US290, to the Amateur Service on a secondary basis.[13] The purpose of allocating 1900-2000 kHz to the radiolocation service was to provide relocation spectrum for radiolocation stations that would be moved out of the 1605-1705 kHz band when expanded-band AM broadcasting would be implemented in that band. Indeed, Section 90.103(c)(28) notes that until July 1, 1988, the band would only be available for licensees of stations which were displaced from 1605-1700 kHz, and that after that date, requests for new station authorizations would be accepted, subject to certain procedures and

[13] Amendment of Part 2 of the Commission's Rules Regarding Implementation of the Final Acts of the World Administrative Radio Conference, Geneva, 1979, General Docket 80-739, *Second Report and Order*, 49 FR 2358, 2360 paras. 21 and 24 (Jan. 19, 1984) (*WARC-79 Second R&O*).

subject to the geographic separation requirements of Section 90.103(c)(26), since exclusive channel licensing was provided for. Therefore, operation of ocean buoys at 1900-2000 kHz as described by ITM is not possible under current Commission rules and in fact, none of its products is appropriately licensed to any United States-registered fishing vessel. ITM Marine has failed to state any valid basis for continuing a secondary allocation for the Amateur Service in this band, and the Notice proposal to upgrade the Amateur allocation from secondary to primary should be implemented immediately.

Therefore, given the foregoing and the comments previously filed by ARRL, it is again respectfully requested that the Commission issue a Report and Order at an early date making the LF and MF allocation changes in the domestic Table of Frequency Allocations, and the Part 97 service rule changes which were under consideration or were proposed in the Notice, and which were supported by ARRL herein, so as to: (1) allocate the 135.7-137.8 kHz band to the Amateur Radio Service on a secondary basis; and (2) elevate the secondary Amateur Service allocation in the 1900-2000 kHz band to primary status.

Respectfully submitted,

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